

9.16.2020 EFED-Academics Conversation

VGX field studies – transect distances to damage

Did rainfall or irrigation

Culpepper: looking at irrigation for 3-4 years, 3500th of irrigation – ½ in of irrigation can eliminate movement/volatility, starting using this with growers this year, EPA has concerns about irrigation moving dicamba off target (runoff) – with sandy loam or sandy soil, there's no runoff – what would give confidence on that?

VGX: tunnel studies – clearly rate dependent and rate by environmental interaction (data still being input in computer but happy to share). As environment gets more challenging, need more VGX to get equivalent volatility control. Reducing volatility to some extent irrelevant of the rate used.

Rodriguo Werle - In WI, and had similar experience as Culpepper, VGX made a huge difference – though liberty removed benefits, even seeing benefit when adding gluphosinate. High temp and low air movement shows the most value

Li – 80 oz better than 40oz, 40oz better than nothing. Alabama.

Practical amount for grower: dependent on cost. Definitely doable for growers to use at recommended and increased rates

Stability in the tank – sitting in the tank pre-application for days. How long did you wait between tank mix and application?

Culpepper – longest waited was 5 hours

Rodriguo – always within a couple hours.

Tom Mueller - TN, would be surprised based on understanding of VGX, would have no dicamba breakdown. Concern is more around

Norsworthy – put out potassium acetate and left in the tank for 2-3 days with no impact on effectiveness against volatility

Spraying soil vs spraying plants – concern for EPA that it's not the same and complicated tunnel study assessment.

True, though soil study to soil study comparison is a good baseline

Surface stability on the plant

Norsworthy – significant increase in volatility if gluphosinate sprayed a few days prior, so whatever is on the plant at the time of VGX spraying makes a big difference

Did you measure pH of tank mix when spraying?

Norsworthy - Potassium acetate does not have strong buffering capacity

Werle – yes, 7.7 then 6.7 with dicamba, 6.3 with dicamba and VGX (extendimax). Noticed pre-formulations with VGX don't do as well as when you tank mix in specific sequence (water, VGX, then dicamba and glyphosate)

Li – Did chemical titration – potassium acetate caps out at 5.7-5.8, and won't go higher irrelevant of how much potassium acetate you add due to pKa. Several other candidates that can bring pH much higher, but some of those also increase volatility

Mueller and Culpepper did comparisons with engenia and extendimax both with and without buffers and glyphosate.

Offers to run any experiments that need specific technical questions answered – 30-45 days to answer questions as needed. Open to suggestions for questions/treatments needed from EPA. Currently running humidome studies and can start studies on Monday. Field studies are ended for the year.

Concerns (Norswothy) that 1.5X concentration is not enough in extreme environmental conditions (ex. Hot with plant vegetation)

1% weight by volume = 1X rate of potassium acetate (10 grams per liter)

Werle been using 2% weight by volume VGX

Norsworthy thinks need to do more mixtures than just potassium acetate

Is there a limit where the buffer is no longer effect, for example at temperature, if there a break point?

Limited work has been done to find a break point

Above 35C (soil temp) reaches critical temperature zone according to Mueller and Werle humidomes

On field trials, what weight by volume buffering agent did you use?

40mL = to 1%

Academics will communicate about rain event and how much VGX was in the system during the trials.

Soil moisture

Culpepper tunnel studies – can manipulate volatility with antecedent soil moisture, increased volatility with increased soil moisture, however irrigation following application likely drives dicamba down into the soil and reduces volatility

Norsworthy agrees given that there is no horizontal flow with sandy and sandy loam soil

Big Picture Takeaways

All studies performed in 2019 with VGX, Norsworthy uses same formulation (potassium acetate) but not VGX

Significant reductions under normal climatic conditions, less under extreme conditions (tied to soil temp), more VGX will control volatility better – seen in humidome and tunnel studies

Can be very successful, but situations (vary across states) its less effective

Having it watered in really drops volatility, but careful about not overwatering to create runoff

Questions about how much of soybean is irrigated or irrigatable

How long would it take to water in full field

Either use a lot more during extreme events or alternative formulation backstops

Soil temps can get very high (easily 120F) depending on region and soil coloration

Stable in tank over several hours and Norsworthy found stable over days

Alternative buffering agents used and found to be successful

Addition of glyphosate significantly increases volatility but all growers tank mixes it